

New Species of *Eleodes* (*Blapyllis*) from Western United States

(Coleoptera: Tenebrionidae)

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The subgenus *Blapyllis* last received comprehensive treatment by Blaisdell in 1909. Subsequently, Boddy (1957) described two additional species. Five new species of this complex group of beetles are here described in order to make the names available for more comprehensive revisionary work in preparation. Species groups and other infrageneric groupings will be defined then. A provisional key to species of *Blapyllis* is given in Somerby (1972).

The species descriptions include three ratios: 1) elytral length divided by greatest width; length is measured from the last third of the scutellum to the tip of the elytral apex; 2) length of the foretibia divided by the length of the pronotum; length of the foretibia is measured from the most proximal point to the most distal point (not including the setae along the distal margin, see fig. 19a). Pronotal length is measured along the middorsal line; 3) the length of the setal pad (as measured along the venter of the probasitarsus) divided by the height of the basitarsus. Preabdominal width of the epipleura is measured at the point where the abdomen joins the thorax.

Eleodes wakelandi, new species

(figs. 3, 20, 21)

Diagnosis. — *Eleodes wakelandi* is most similar to *E. novoverruculus* Boddy and *E. nunemacheri* Blaisdell (elytral tubercles well developed to the midline excluding the punctae). *Eleodes wakelandi* is smaller than *novoverruculus* and differs in having the pronotum hirsute laterally to pilose medially with the propleura pilose, the pilose condition being absent in *novoverruculus*. *Eleodes wakelandi* is separable from *nunemacheri* by having somewhat smaller tubercles along the medial area of the elytra with dorsum semi-hirsute (pilose in *nunemacheri*). Females of *wakelandi* can be separated from the females of all other species of *Blapyllis* by their broad ovipositor valves (figs. 20, 21).

Holotype female. — CAS Type No. 11,445, exemplar male, and 12 male, 12 female paratypes from Sucker Creek, Malheur County, Oregon, VII-30-1926; collected by C. Wakeland.

Holotype and seven paratypes, California Academy of Sciences, San Francisco; 18 paratypes, Brigham Young University, Provo, Utah, and University of Idaho, Moscow. Features of exemplar male which differ from holotype included in parentheses.

Head. — Eyes with lateral surface slightly convex posteriorly; genal process of moderate length; median lobe of mentum rounded and slightly reduced.

Prothorax. — Notum (fig. 3) 2.9 mm (2.8 mm) long, 4.0 mm (3.7 mm) wide; punctae large (moderate), deep, tubercles present next to margin, vestiture pilose to laterally hirsute. Anterior emargination slight, apical angles rounded; anterior width of pronotum narrower (slightly narrower) than posterior width; lateral margin arcuate (moderately arcuate), non-angulate, basal constriction moderately (slightly) developed; convexity (as seen in cross section) strong (moderate) with lateral fourth slightly deflexed. Pleura punctate, tuberculate, tubercles small to moderate, extending to basal area, vestiture pilose on shiny surface. Prosternum with process reduced.

Elytra. — Length 6.7 mm (6.1 mm), width 5.4 mm (4.7 mm); length to width robust 1.7 (1.3). Punctae absent, moderate sized tubercles present laterally to medially with two subequally distinct sizes except medially; vestiture nearly hirsute on a shiny surface without alutaceous network. Elytra moderately expanded (slightly expanded) basally; with moderately abrupt deflection (planate) from base to disc. Elytral apex sloping strongly, blunt. Epipleura 0.54 mm (0.51 mm) wide at base with clearly formed moderately deep punctae and fine tubercles, lacking alutaceous network; basal width moderately expanded (subequal) compared to preabdominal width; humeral area inflated (lateral aspect weakly angled), humeri slightly angled.

Venter. — Abdomen with moderately large, deep punctae; tubercles absent on second visible sternite, surface shiny. foreleg in anterior silhouette with distal, ventral surface of femur straight; tibia with proximal, ventral border not constricted, short, ratio 0.72 (moderate, 0.86), ventro, distal surface of basitarsus moderately produced (slightly produced).

Secondary sexual characteristics. — Male with golden tuft of setae on probasitarsus minute, ratio 0.2; fine golden setae present in plantar groove of second protarsal segment, absent from groove of first segment of mesotarsus. Female with coarse black setae on plantar surface of probasitarsus distributed as strongly projecting bundle. Parameres is in figure 15, 24; valvifer 2, figure 20, 21.

Comments. — The species was named in honor of Claude Wakeland who studied the biology and ecology of several economically important species of *Eleodes* from the Reburg Bench region of Idaho. His work was published in 1926 as a Research Bulletin.

The holotype has a 1932 Blaisdell determination label with the name *Eleodes nunenmacheri verrucula* Blaisdell. This name was applied to a number of species having some populations with similar elytral sculpture (see Boddy 1957:196), particularly the large round tubercles with smaller tubercles in the interstices. *Eleodes wakelandi* was also previously determined as *E. caseyi* Blaisdell, *E. pimelioides* Mannerheim, *E. brunripes* Casey, *E. cordatus* Eschscholtz, and *E. brevisetosus* Blaisdell. Boddy (in Hatch, 1965:156) misidentified specimens of *wakelandi* as *caseyi*. The two species are remarkably similar to each other. (See Somerby, 1972; Somerby and Doyen, 1975).

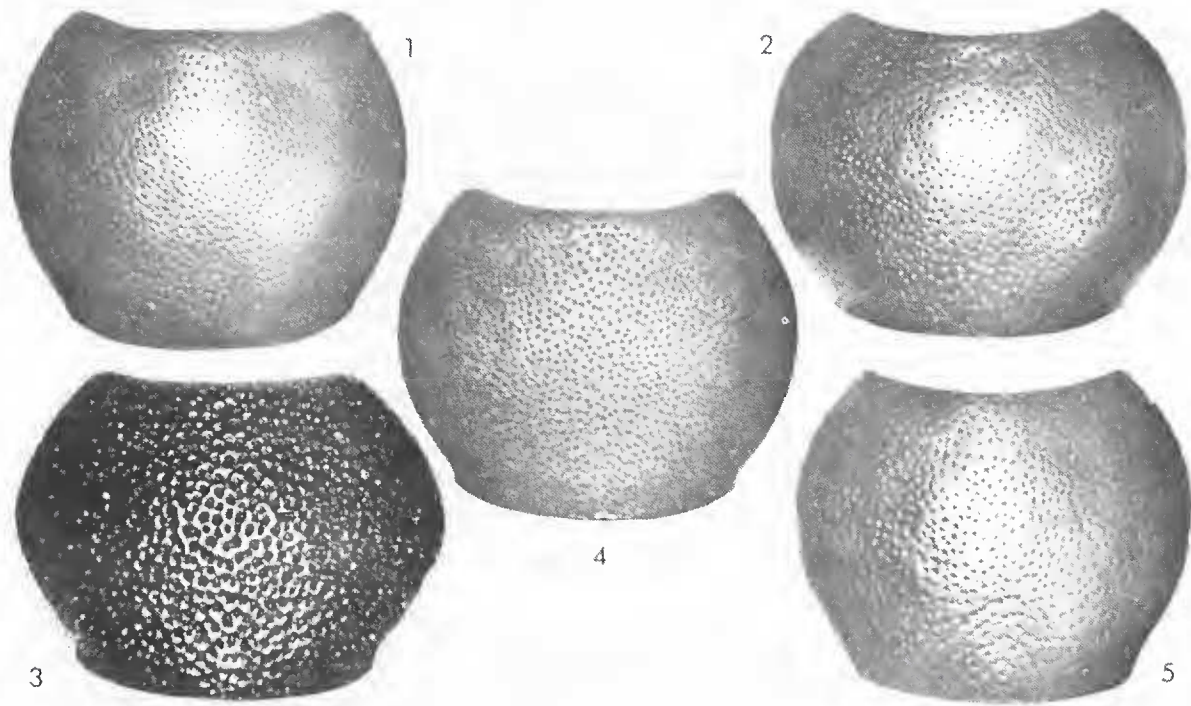
Ecology and distribution. — Desert scrub to arid coniferous woodland, 700 m to 1500 m, April to September from southern Idaho (many records) and southeastern Oregon, south and east to northern Utah. Barr (personal communication) records specimens from *Chrysothamnus* at Mountain Home, Idaho. One museum specimen was found with a tachinid (Diptera) pupa.

Specimens examined. — 49 males, 36 females. Idaho: Bonneville County, Idaho Falls; Canyon County, Caldwell, Parma; Carabou County, Soda Springs; Elmore County, Mountain Home; Fremont County, St. Anthony; Jefferson County, Terreton; Madison County, Rexburg; Minidoka County, Rupert, 4 mi. E.; Owyhee County, Big Area; Power County, American Falls; Twin Falls County, Twin Falls; Not placed in county; Fort Sherman. Oregon: Malheur County, Sucker Creek. Utah: Weber County, Ogden.

***Eleodes panamintensis*, new species** (Figs. 6, 11, 12, 16, 17)

Diagnosis. — This species is most similar to *E. tenebrosus* Horn from which it is separated by having the proximal, ventral border of the protibia moderately constricted (females, slightly constricted). The mesobasitarsus of the male lacks fine yellow setae in the distal plantar area, the pronotal disc lacks a basal constriction of the lateral margins which are weakly arcuate.

Holotype male. — CAS Type No. 11,435, and exemplar female, Thompson Camp, Panamint Mountains, 2030 m, Inyo County, California, VIII-19-1970, collected by L. La Pre X-2-1970. Seven male, 11 female paratypes, from type locality from III-29-1970 to VII-19-1971. One male paratype, Cowdung Canyon, Panamint Mountains, 2075 m, VII-3-1971, K. Mieras. The holotype and 6 paratypes are deposited in the California Academy of Sciences. Other paratypes in California Insect Survey, Kirby W. Brown collection, Los Angeles County Museum, Ohio State University, United States National Museum, and



Figs. 1-5 *Eleodes* (*Blapyllis*) sp.; pronotum, dorsal view: Fig. 1, *E. aristatus* new species holotype; Fig. 2, *E. orophilus* new species, holotype; Fig. 3, *E. wakelandi* new species, holotype; Fig. 4, *E. volcanensis* new species, holotype; Fig. 5 possibly *E. tenebrosus* from Spider Cave (Snake Creek Region), White Pine Co., Nevada.

Ronald E. Somerby collection. Features of exemplar female which differ from holotype included in parentheses.

Head. — Eyes with lateral surface slightly convex posteriorly; genal process of moderate length; median lobe of mentum rounded, lateral lobes of mentum exposed.

Prothorax. — Notum (fig. 6, surface as in 5) 4.3 mm (4.4 mm) long, 5.2 mm, (5.8 mm) wide; punctae small, shallow, tubercles present next to margin; vestiture inconspicuous, not noticeably hispid laterally, surface matte. Anterior emargination moderate, apical angles obtuse, anterior width of pronotum slightly smaller than posterior width (anterior width subequal to posterior width); lateral margin slightly arcuate, non-angulate, basal constriction absent; convexity (as seen in cross section) strong (moderate) with lateral fourth slightly deflexed. Pleura with punctae not evident, tubercles small with large tubercle free areas (reduced tubercle free area); vestiture hispid on submatte surface. Prosternal process moderately developed.

Elytra. — Length 11.4 mm (12.2 mm), width 6.4 mm (7.5 mm) length to width long, 1.8 (1.6). Moderately large, deep punctae present medially to laterally, coalescing in dorso-lateral area; punctae and tubercles in incipient rows. Tubercles small but variable with most larger tubercles of same diameter, with little size reduction laterally to medially; vestiture hispid, surface matte with some alutaceous lines. Elytra slightly expanded basally; planate from base to disc; elytral apex oval (subobtuse), gradually sloping. Epipleura 0.6 mm wide at base with faint shallow punctae, fine tubercles sparse to absent basally, lacking an alutaceous network; basal width subequal to preabdominal width, humeral area inflated, humeri rounded.

Venter. — Abdomen with moderately large, deep punctae; tubercles present on second visible sternite (scarcely present medially although noticeable laterally), surface submatte. Foreleg in anterior silhouette with distal, ventral surface of femur slightly sinuate; tibia with proximal, ventral border moderately constricted (slightly constricted), moderately long, ratio 1.0 (0.9), distal, ventral surface of basitarsus not produced.

Secondary sexual characteristics. — Male with setal pad on probasitarsus minute, ratio 0.2; lacking fine golden setae in plantar grooves of second protarsal segment and

first segment of mesotarsus. Female with coarse black setae on plantar surface of probasitarsus distributed as two loosely consolidated lateral rows. Parameres figure 11, 12; valvifer 2, figures 16, 17.

Comments. — The general overall size, appearance, and shape of the pronotum in *panamintensis* is quite similar to *E. (Melaneleodes) concinnus* Blaisdell with which it is sympatric. The two species are easily confused with one another in the field.

Ecology and distribution. — Examples were taken in Pinyon-juniper woodland under leaf litter and trash from 2000 m to 2100 m, from June through October.

Specimens examined. — 9 males, 11 females. California: Inyo County, Panamint Mountains, Cowdung Canyon, Thompson Camp (site of Panamint City).

***Eleodes aristatus*, new species**

(Figs. 1, 9, 10, 13, 14)

Diagnosis. — This species is most similar to *E. tenebrosus* from which it differs by having distinct, moderately deep punctae on a submatte pronotal disc (Fig. 1). *Eleodes tenebrosus* from the White Mountains have shallow punctae on a matte pronotal disc (Fig. 5). Females of *aristatus* differ from *tenebrosus* by lacking coarse black setae that interrupt the probasitarsus.

Eleodes aristatus is also similar to *E. robinetti* Boddy from which it differs by having the apical and basal pronotal widths subequal with the pronotal punctae smaller and less dense. In *aristatus* the tibial length is less than the pronotal length (10 males, mean 0.96, range 0.92 to 1.0; 1 female, 0.88; in *robinetti* tibial length is relatively greater (10 males, mean 1.06, range 1.02 to 1.10, 1 female 0.94).

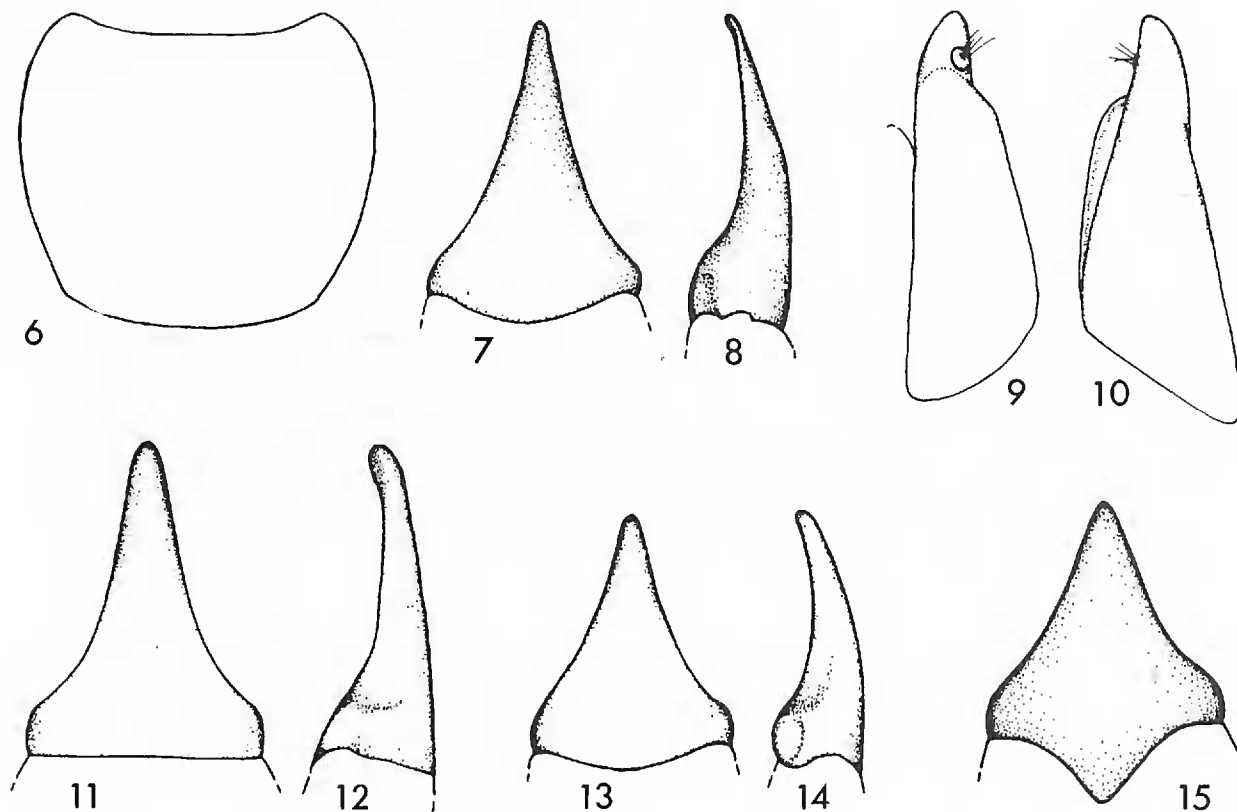
Holotype male. — CAS Type No. 11,436, and exemplar female, Crooked Creek Laboratory, White Mountains, 3085 m, Mono County, 3 airline miles, north Inyo County line, California, VII-II-1961, collected by H. V. Daly. Fourteen male, 8 female paratypes from type locality from VII-11-1961 to VIII-20-1963. The holotype and six paratypes will be deposited at the California Academy of Sciences. Other paratypes in the Essig Museum of Entomology. Paratypes will be sent to Kirby W. Brown, Los Angeles County Museum, Ohio State University and the United States National Museum. Features of exemplar female which differ from holotype are included in parentheses.

Head. — Eyes with lateral surface slightly convex posteriorly; genal process of moderate length; median lobe of mentum variably angular (rounded), lateral lobes of mentum exposed (weakly obscured).

Prothorax. — Notum (Fig. 1) 3.5 mm (3.4 mm) long, 4.3 mm (4.5 mm) wide; punctae small, moderately deep, tubercles present on lateral third, vestiture inconspicuous, not noticeably hispid laterally; surface submatte. Anterior emargination moderate, apical angles obtuse, anterior width of pronotum slightly smaller than posterior width (anterior width subequal to posterior width); lateral margin slightly arcuate, non-angulate, basal constriction slightly sinuous; convexity (as seen in cross section) moderate with lateral fourth evenly arcuate. Pleura with punctae not evident, tubercles small to moderate, and restricted to basal area; vestiture hispid on submatte surface. Prosternal process moderately developed.

Elytra. — Length 8.7 mm (8.4 mm), width 5.1 mm (5.7 mm) length to width long, 1.7 (moderate, 1.5). Moderate, shallow punctae present in medial area, punctae and tubercles evenly distributed. Tubercles small with most larger tubercles of subequal size, with little reduction laterally to medially; vestiture hispid, surface matte without obvious alutaceous network. Elytra slightly expanded basally; planate from base to disc. Elytral apex oval (subobtuse) gradually sloping. Epipleura 0.60 mm (0.66 mm) wide at base, without evident punctae, with fine tubercles sparse to absent basally, lacking in alutaceous network; basal width moderately expanded compared to preabdominal width, humeral area inflated, humeri rounded.

Venter. — Abdomen with moderate (small), shallow punctae; tubercles present on second visible sternite, surface shiny. Foreleg in anterior silhouette with distal, ventral surface of femur slightly sinuate; tibia with proximal, ventral border not constricted, of moderate length, ratio 0.92 (short 0.88); ventrodorsal surface of probasitarsus not produced.



Figs. 6-15 *Eleodes* (*Blapyllis*) sp.; pronotal outline and genitalia: Fig. 6, *E. panamintensis* new species, pronotal outline of holotype; Fig. 7, 8, *E. volcanensis* new species: dorsal view; lateral view of parameres, respectively of holotype; Fig. 9, 10, *E. aristatus* new species: dorsal view; ventral view of valvula, respectively of topotype; Fig. 11, 12, *E. panamintensis* new species: dorsal view; lateral view of parameres, respectively of holotype; Fig. 13, 14, *E. aristatus* new species: dorsal view; lateral view of parameres, respectively of holotype; Fig. 15, *E. pimelioides* from Fort Bridger, Uinta Co., Wyoming, dorsal view of parameres of holotype.

Secondary sexual characteristics. — Male with setal pad on probasitarsus short, ratio 0.41; fine setae present in plantar groove of second protarsal segment. Lacking fine golden setae in plantar groove of first segment of mesotarsus. Female with coarse black setae on plantar surface of probasitarsus distributed as two loosely consolidated lateral rows. Parameres figure, 13, 14; valvifer 2, figure 9, 10.

Comments. — The species is named after the bristlecone pine (*Pinus aristata* Engelman). Examples of *E. aristata* were previously determined as *tenebrosus*.

Ecology and distribution. — The species occurs in the bristlecone pine community in the White Mountains of Inyo and Mono counties along the California-Nevada border northeast of Bishop, California, from 3400 m to 3700 m, in sympatry with *E. tenebrosus*. The latter is more abundant at lower elevations (below 3500 m). Examples of *aristatus* were taken in June, July and August.

Specimens examined — 31 males, 33 females. California: Inyo County, Patriarch Tree, Reed Flat, Schulman Grove bristlecone pine area, White Mountains; Mono County, Big Bend Public Camp, Blanco's Corral, Cottonwood Creek, Crooked Creek Laboratory, Piute Mountain, Sheep Mountain.

***Eleodes volcanensis*, new species**

(Figs. 4, 7, 8, 18)

Diagnosis. — This species is most similar to *E. robinetti* from which it differs in having a more pronounced basal pronotal constriction and by the elytral surface forming an obtuse angle with the epipleura, rather than being inflated as in *robinetti*. The forelegs

are relatively long and less robust (Fig. 18) than the forelegs of other related species, except *robinetti*. The prosternal process of *volcanensis* is reduced with the propleural tubercles small and with a tubercle-free area posterodorsal of the coxae. The elytral punctae are moderate, somewhat deep.

Holotype male. — CAS Type No. 11,437, Crater Lake National Park, Klamath County, Oregon, VII-14-34, collected by E. C. Van Dyke. Holotype male and one male paratype from type locality deposited in the California Academy of Sciences.

Head. — Eyes with lateral surface slightly convex posteriorly; genal process of moderate length; median lobe of mentum rounded, lateral lobes of mentum exposed.

Prothorax. — Notum (Fig. 4) 3.3 mm long, 4.1 mm wide, punctae moderately large, deep, tubercles present on lateral third, vestiture inconspicuous and not noticeably hispid laterally, surface submatte. Anterior emargination moderate, apical angles obtuse; anterior width of pronotum slightly smaller than posterior width; lateral margin arcuate, non-angulate, base moderately constricted; convexity (as seen in cross section) moderate with lateral fourth evenly arcuate. Pleura with punctae not evident, tubercles small, large tubercle-free area near base, vestiture hispid on shiny surface; prosternal process reduced.

Elytra. — Length 8.3 mm, width 5.2 mm, length to width 1.6. Large, deep punctae medially to laterally, coalescing in dorso-lateral area; punctae and tubercles evenly distributed. Tubercles small but variable, with tubercles largest dorsolaterally, smallest medially. Vestiture hispid, shiny surface with some alutaceous lines present, the lines intercepting margins of tubercles. Elytra slightly expanded basally, planate from base to disc; elytral apex oval, gradually sloping. Epipleura 0.65 mm wide at base without evident punctae, with fine sparse tubercles becoming absent basally, lacking an alutaceous network; basal width expanded compared to preabdominal width, humeral area obtuse, humeri slightly angled.

Venter. — Abdomen with moderate, shallow punctae; tubercles present on second visible sternite on shiny surface. Foreleg in anterior silhouette with distal, ventral surface of femur straight; tibia with proximal, ventral border not constricted, long, ratio 1.05; ventrodistal surface of probasitarsus not produced.

Secondary sexual characteristics. — Male with setal pad on probasitarsus short, ratio 0.41; fine setae present in plantar groove of second protarsal segment. Lacking fine golden setae in plantar groove of first segment of mesotarsus. Female with coarse black setae on plantar surface of probasitarsus distributed as two loosely consolidated lateral rows. Parameres as in figure 7, 8.

Comments. — The species is named after the type of mountain on which the specimens were initially found. This species may represent a geographic variant of *robinetti*, but is dissimilar enough to warrant species status at this time.

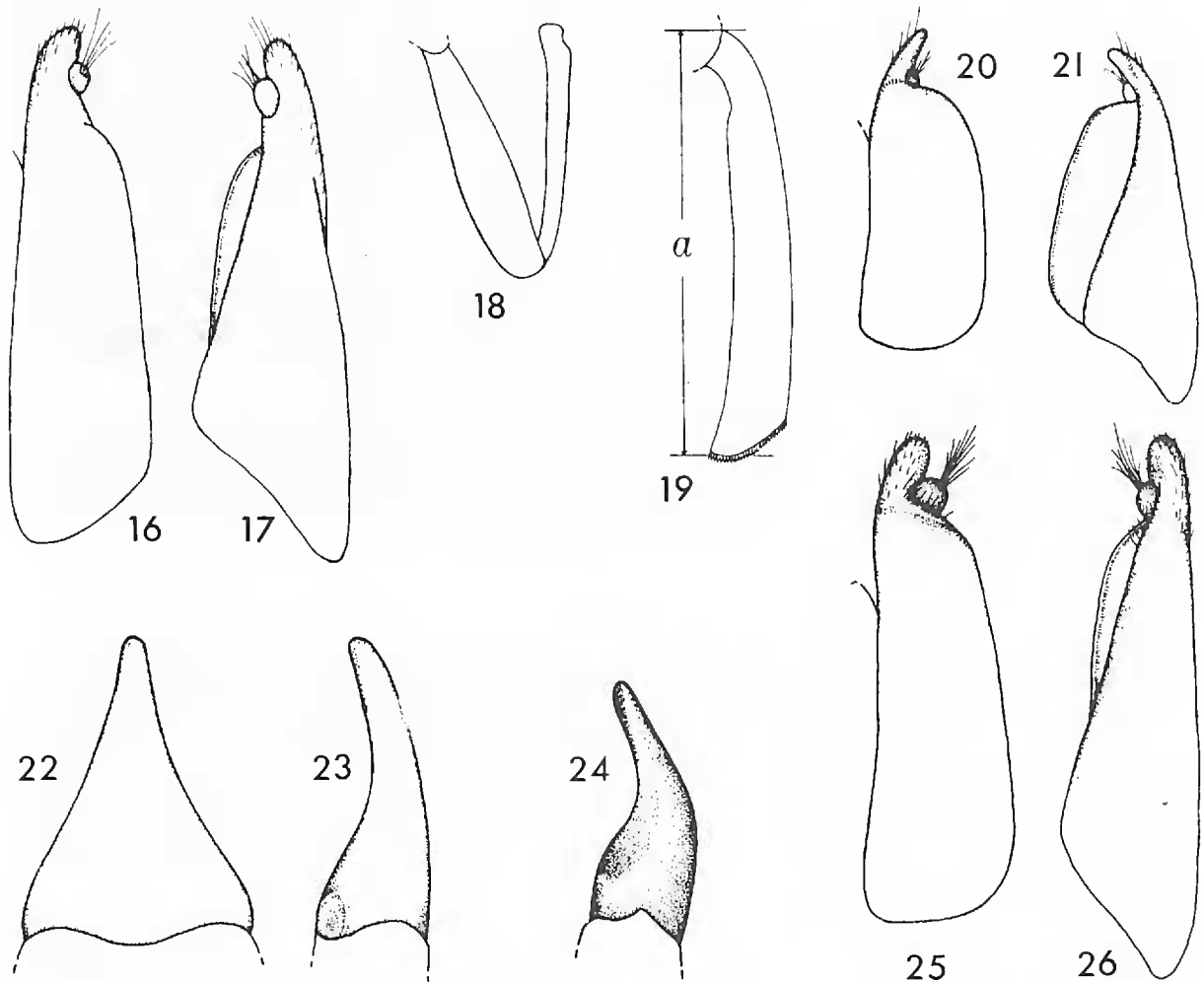
Ecology and distribution. — Examples were taken in June and July in Lassen and Crater Lake National Parks.

Specimens examined. — 3 males. California: Lassen National Park; Oregon: Klamath County, Crater Lake National Park.

***Eleodes orophilus*, new species**

(Figs. 2, 22, 23, 25, 26)

Diagnosis. — This species is most similar to *E. snowi* Blaisdell from which it is differentiated by having the pronotal apical angles obtuse; by having a basal constriction of the pronotal disc; by lacking tubercles in the basal half of the propleura; and by having fewer, smaller tubercles over the elytral disc, with an alutaceous network of lines which give the surface a slightly rugose appearance. Males of *orophilus* differ from the respective sex of *E. horni* Blaisdell, *E. lecontei* Horn, *E. hoppingi* Blaisdell, *E. patulicollis* Blaisdell, and *E. tenebrosus* Horn by having the proximal, ventral border of the protibia moderately constricted.



Figs. 16-26 *Eleodes (Blapyllis)* sp.; genitalia and leg parts: Figs. 16, 17, *E. panamintensis* new species: dorsal view; ventral view of valvula, respectively of topotype. Fig. 18, 19, *E. volcanensis* new species: foreleg; tibia, respectively of holotype; Fig. 20, 21, *E. wakelandi* new species: dorsal view; ventral view of valvula, respectively of holotype; Fig. 22, 23, *E. orophilus* new species: dorsal view, lateral view of parameres, respectively of holotype; Fig. 24, *E. rotundipennis* lateral view of parameres from Sunrise Park, Pierce Co., Washington; Fig. 25, 26, *E. orophilus* new species: dorsal view; ventral view of valvula, respectively of topotype.

Holotype male — CAS Type No. 11,438, exemplar female and 33 male, 35 female paratypes at base of Humphrey's Peak, San Francisco Peaks, 2900 m, Coconino County, Arizona, August, collected by Snow (no additional data). Holotype and seven paratypes, California Academy of Sciences, San Francisco; 2 paratypes, University of Arizona, Tucson; 59 paratypes, University of Kansas, Lawrence. Features of exemplar female which differ from holotype are included in parenthesis.

Head. — Eyes with lateral surface slightly convex posteriorly; genal process of moderate length (short); median lobe of mentum rounded, exposing lateral lobes.

Prothorax. — Notum (Fig. 2) 3.8 mm (4.3 mm) long, 5.2 mm (6.1 mm) wide; punctae small, moderately deep; tubercles present next to margin, vestiture inconspicuous and not noticeably hispid laterally, surface shiny. Anterior emargination moderate, apical angles obtuse; anterior width of pronotum slightly smaller than posterior width; lateral margin arcuate, non-angulate, basal constriction weakly developed; convexity (as seen in cross section) moderate (strong) with lateral fourth slightly deflexed (evenly arcuate). Pleura with punctae not evident, tubercles small, with large tubercle-free area near base of pleura, vestiture hispid on shiny surface. Prosternal process reduced.

Elytra. — Length 10.4 mm (11.6 mm), width 6.4 mm (8.2 mm); length to width 1.6 (1.4). Moderately large, deep punctae present medially to laterally, coalescing in dorsolateral area; punctae and tubercles evenly distributed. Tubercles small (minute), but variable-

in diameter with largest present dorsolaterally, smallest dorsally; vestiture pilose, surface shiny with alutaceous lines intercepting margins of tubercles. Elytra slightly expanded basally; planate from base to disc, elytral apex subobtusate, gradually sloping. Epipleura 0.82 mm (1.03 mm) wide at base with faint shallow punctae, fine tubercles sparse to absent basally, surface conspicuously alutaceous (subalutaceous); basal width moderately expanded compared to preabdominal width; humeral area obtuse, humeri rounded (slightly angled).

Venter. — Abdomen with small, shallow punctae; tubercles present (incipiently present) on second visible sternite with shiny surface. Foreleg in anterior silhouette with distal, ventral surface of femur sinuate (slightly sinuate); tibia with proximal-ventral border moderately constricted (not constricted), moderately long, ratio 0.94 (short 0.80), distal, ventral surface of probasitarsus not produced (slightly produced).

Secondary sexual characteristics. — Male with setal pad on probasitarsus short, ratio 0.50; fine golden setae present in plantar groove of second protarsal segment, absent in plantar groove of first segment of mesotarsus. Female with coarse black setae on plantar surface of probasitarsus distributed as strongly projecting bundle. Parameres figure 22, 23; valvifer 2, figure 25, 26.

Comments. — The name *orophilus* is derived from *oro*, Greek for mountain and *phil*, Greek for loving. This species is commonly found in mountainous areas. The basal constriction of the pronotal disc is occasionally absent to usually slightly sinuous. Many examples of *orophilus* were previously determined as *E. snowi* by Blaisdell.

Ecology and distribution. — High mountains of Arizona and New Mexico occurring abundantly in open stands of quaking aspen, becoming rare in pine forests at lower elevations. Specimens were taken from 1990 m to 3200 m. They are particularly sensitive to desiccation as are other *Blapyllis* that occur in cool, damp habitats. Examples were taken in June, July and August.

Specimens examined — 244 males, 215 females. Arizona: Apache County, Aspen Springs, Big Lake, McKays Peak (near McNary), White Mountains; Coconino County, Flagstaff, Grand Canyon, Mormon Lake, Mud Spring, Mormon Mountain, Oak Creek Canyon, San Francisco Peaks, base of Humphreys Peak, Snow Bowl, Williams; Gila County, Payson, Pinal Mountains; Graham County, Geronimo; Arizona records not assigned to county, S. Arizona, Colorado River; New Mexico: Catron County, Apache National Forest; Sierra County, Black Range Mountains; Socorro County, Bear Trap Camp, 28 mi. SW Magdalena, Magdalena.

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